

The fungal biodiversity of India contribute about 23,000 different fungi. World fresh water fungi are counted as many as 320 sps. And out of that, Indian fresh water fungi represent only 98 sps. (Hawksworth, 1991). Large numbers of aquatic fungi are exploited by various people and the number is still increasing day by day. While, large numbers of fungi are yet to be studied.

The major contribution in fungal study was done by Saccardo (1886-1885). He published the scheme of classification and described the various genera in his work "Sylloge Fungorum" time to time. De Wildman (1893, 1894, and 1895) recognized the various forms, present in water as, spores, conidia etc. He reported three aquatic fungal genera viz. *Clavariopsis*, *Lemonniera* and *Tetracladium*. Later on in (1942), Prof. C.T. Ingold collected foam samples in "Little Brook" from England. He observed the foam samples, which were full of tetra-radiate and variously branched as well as sigmoidly curved and filiform. He also studied the substrates, on which they grow. He recognized 16 species in his classical account, "Aquatic Hyphomycetes of decaying water leaves." 10 of them were reported new and two were recombined into two genera. Ingold (1943-1956) studies different aquatic fungi alone & along with his students viz. Ingold and Cox 1957; Hudson and Ingold 1960, who described 19 new taxa and compiled with known species of aquatic fungi. Ingold and Ellis (1952), jointly worked on occurrence and distribution of waterborne fungi.

In India, Butler (1907) was the first, to reported occurrence of aquatic phycomycetes fungi. He described *Allomyces* and *Phythium* species from aquatic foam. Later on, Johnson (1956), Sparrow (1960), Dayal and Kiran (1988) and Khulbe (1983) studied various methods for isolation, purification of Aquatic Fungi and listed number of the aquatic phycomycetous fungi. Various British and Japanese mycologists took keen interest in the study of aquatic fungi, from various countries. They are viz. Ranzonia (1953), from California, Tubaki (1957), from Japan, Petersen (1960), from USA and Nilson (1964) etc. Greathead (1961), established two species of *Anguillospora filiformis*, *Articulospora grandis*. Alasodura (1968) established genus *Flabellospora* and also studied the occurrence and distribution of different waterborne fungi. Jones (1968), reported 5 higher fungi on submerged woods from Mumbai and Cochin coasts. The terrestrial occurrence of some aquatic hyphomycetes

fungi studied by Robert Bandoni (1972). He concluded that, a number of fungi, not generally designated as aquatic hyphomycetes viz., *Pestalotia*, *Tetraploa*, *Triposporium*, *Acaulopage* etc. Raghukumar (1973), studied marine lignicolous fungi and recorded, 12 Ascomycetous and 6 Hyphomycetous fungi from Chennai waters. Iqbal and Webster (1973), extensively worked on the morphology and ecology of aquatic fungi and stated that, aquatic spores were found abundant, in autumn and less in summer. The rapid increase in spore number was the result of colonization of leaves by the low, but effective inoculum of leaves. Barlocher's contribution (1974, 1990, 1991, 1992) in this field of aquatic fungi is remarkable and is a milestone in the studies of the hyphal interactions, among aquatic hyphomycetes as well as the ecology of aquatic hyphomycetes. Ingold and Webster (1973), for the first time reported three species of waterborne fungi from Chennai. Ingold (1975), confirmed, spectacular flora of "Saprophytic microfungi" which grow in submerged decaying leaves and twigs in flowing streams and rivers in a classical documentation entitled, "An illustrated Guide to Aquatic and Waterborne Hyphomycetes (Fungi Imperfecti)" with notes on biology of the fungi. Later, Descals and Webster (1981) fondly referred aquatic hyphomycetes as "Ingoldian Fungi." Matushima (1971, 1975, 1980, and 1993) published many new staurosporous taxa on leaf litter, from tropical and subtropical areas of Taiwan.

The contribution of Dudaka, in the field of morphology of aquatic hyphomycetes is monumental one. She (1974), listed 89 species of Aquatic hyphomycetes from Ukrain. Later in 1985, she published a book 'Aquatic Fungi – Imperfecti' of U.S.S.R. which included 196 species of aquatic hyphomycetes. Kolhmeyer's contribution (1968), in the field of marine fungi is remarkable one. Kolhmeyer et. al. (1979) published their work, under the title 'Marine Mycology.' And explained that, fungi may be saprobic on various type of organic materials found in marine waters or parasitic or endophytic on different types of plants and animals.

Khulbe (1977 – 87, 1991), studied on 'Watermolds of Nainital and its Suburbs' and in 1985 he published 'Aquatic Phycomycetes'. He used different baits i.e. plants and animals for the isolation of aquatic fungi. Later on, he continued his work with his students, Khulbe and Verma (1983), Khulbe and Sati (1979) and reported various species of aquatic phycomycetes from Nainital (U.P.). Ingold (1975) & Goos (1987), explained that, many of the aquatic species were known for their distinctive conidia which are highly branched and helically coiled. Goos (1987),

worked on helicosporous members and described this group as “Fungi with a Twist.” He pointed out that as, “Ingoldian fungi” and stated that not all species are strictly aquatic. Some species are terrestrial, plant pathogens and litter composers. Also they are teleomorph members of pyrenomycetes, discomycetes and loculoascomycetous fungi.

Subramanian (1962, 1979, and 1983) contributed significantly in the field of hyphomycetes. He classified hyphomycetes on the basis of different characters. He (1979) studied some higher fungi from Indian mangroves. In (1981), along with Bhat, he studied, some foam samples from Western Ghats and described various aquatic fungi. Bhat (1998) alone and along with his students concentrated on the study of aquatic fungi from Goa. (Sreekala and Bhat 2002, Soosama et. al., 2001) and reported various new species of aquatic hyphomycetes in and around Goa.

Kirk (1984), synonymed *Wiesneriomyces javanicus* to *W. laurinus*. He also studied large number of genera of aquatic fungi. Patil and Kapandis (1979) also reported some aquatic fungi from different localities from Pune (M.S.). On the basis of culture technique Nawawi (1985), established the new genus *Flabellocladia* with type species *F. gigantia* and transferred to *Fabellospora* Nawawi. The most productive research in the field of isolation of conidia has been done by Nawawi (1985, 1987). Later, collaboration with Kuthubuteen (1987), he made excellent studies of aquatic fungi in Malaysia. Many conidial anamorphs were studied with keen and deep interest by many investigators viz. Marvanova and Bandoni (1987), Webster (1993), Nawawi and Webster (1982) and Marvanova et. al. (1991).

The survey of aquatic hyphomycetes of the Indian sub-continent, has been done and compiled by many researchers viz. Dayal (1961); Subramanian (1979), Manoharachary and Rao (1981), Sridhar and Kaveriappa (1982), Sridhar (1984), Bhat (1998), Khulbe (2001), and Sati (2006). Some more Indian mycologists explored the southern part of Indian for aquatic fungi viz. Madhusudhan Rao and Manoharachary (1982), Sridhar and Kaveriappa (1982), Manoharachary and Murthy (1987), Chandrashekar et. al (1991); Sridhar et.al. (1992), Sreekala and Bhat (2002) and Belwal and Sati (2006), Ramesh and Vijaykumar (2006) etc. Vasant Rao, Manoharachary, Suresh Kumar and Subodh (2004), compiled the work and published a book ‘Studies of fungi around some aquatic bodies from Andhra Pradesh’ which accounted the morphology of various groups of aquatic fungi of India.

In Maharashtra, there are very few people, studied aquatic fungi e.g. Patil and Kapandis (1979, 1982), Borse and Patil (1983), who worked on Marine fungi. They described new species of *Halosarpheia* namely, *H. ratnagiriensis*. Patil, N. N. (1998, 1999, and 2003) also studied the aquatic hyphomycetes from Western Ghats. (M.S.) Desale and Gandhe (1996), worked on 'Study of Aquatic fungi of rivers Mula and Muttha from Pune.' They concentrated only on aquatic phycomycetous fungi. Borse and Patil (2008), studied some aquatic spores from the aquatic localities of Buldhana district (M.S.).